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A Study of Curriculum Literacy and Information Literacy Levels of Teacher Candidates in Department of Social Sciences Education

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Abstract: The present study aims to investigate information literacy and curriculum literacy levels of teacher candidates and to identify the relationship between them through their course of study at Faculty of Education. The research model was designed as quantitative one and general screening model was employed. The study group is 895 students, who were reached out of teacher candidates, attending the third and fourth grade in the Classroom Education, Preschool Education, Science Education and Social Sciences Education Departments of Pamukkale University and Sinop University in the 2017-2018 academic year. To achieve the goal of this research study, "Information Literacy Scale" and "Curriculum Literacy Scale" were used. In light of results obtained from the study, it is observable that there are meaningful differences between information literacy and curriculum literacy of teacher candidates in terms of the variables identified. Further, the mean of items measuring teacher candidates' levels of information and curriculum literacy were examined and their levels of "frequency" and "agree" were determined. Ultimately, correlation analysis was performed between information literacy and curriculum literacy and positive relationship was determined at the low, medium and high levels. Also, predictive power of the level of information literacy on the level of curriculum literacy was tested. Aforesaid these four variables together explain 34% of the change in curriculum literacy levels.

Keywords: *Information literacy, curriculum literacy, teacher candidate.*

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Introduction

Many definitions of literacy have been presented throughout the years. These various definitions have resulted from evolution of the sense of literacy teaching in the wake of changing conditions and different needs (Gunes, 1994, p.1). The Turkish Language Association has defined the word "literacy" as "the state of being literate", and the term of "being literate" is depicted as follows: "having the ability to read and write, and being educated" (TDK, 2003). Polat (2005) asserts that literate people are considered people who have not only the ability to read and write various sources of information, but also to interpret and use the information.

In this respect, some of the considerations need to be taken into account to develop literacy skills (Bolat, 2017, p.126). In an effort to develop literacy skills, Onal (2010) outlines following elements:

- The ability to perceive, speak and express the facts
- The ability to interpret the environment and to make sense of the environment on an individual basis
- The ability to utilize the information and to generate new ideas
- The ability to use and integrate systems, and to extract new meanings from these systems
- The ability to use the knowledge obtained and to turn it into behaviors
- The ability to have up-to-date information and skills

We thus can infer a more general approach which is "accomplishing certain goals". In this context, all steps in the curriculum process must be meticulously planned and integrated into learning and teaching process. Curriculum literacy levels of teachers are crucially important in achieving the intended goals in this respect.Considering these skills together, a plenty of definitions in various fields have been made for literacy. Along with the aforesaid skills, such

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concepts as technological literacy, computer literacy, web literacy, visual literacy, media literacy, network literacy, digital literacy are available in the literature (Snavely 1997; Kapitzke 2001). This provides a justification for the use of the term "information literacy".Information literacy is the efficient way of retrieving and evaluating information for problem-solving and decision-making. This skill involves the following factors (Rader, 1991):

- Surviving and being successful in an information /technology environment
- Leading in the fields of productivity and performance in democratic societies,
- Adapting to fast-paced environment,
- Creating a better future for the next generation,
- Finding the necessary information for personal and professional problem solving
- Have good writing and computer skills

As stated by Doyle (1994), information literate people have the ability to learn how to learn because they know how to access, organize, use and convey the information. In other words, when information is needed, information literate people develop the capability to retrieve fast-paced information from a variety of systems and in various formats as well as the ability to use and share the information.

On the other hand, teachers who have poor literacy skills cannot train literate individuals. Given that teaching methods have gone through changes, student-centered approach and interactive learning environments have emerged, and the roles of teachers have shifted from "the one who knows and tells everything" to " the one who experiences learning process together with students and guides them", all these factors obliges teachers to be equipped with information skills. It is yet not sufficient by itself. Teachers should also feel themselves capable of help students build information literacy skills (Akkoyunlu & Kurbanoglu, 2004, p.12). ISTE (International Society for Technology Education, 2000) listed teaching skills that every teacher must have, including information and technology skills. ALA (American Library Association) also stressed out that teachers must be equipped with information literacy skills and have the ability to use new educational technologies. (ALA, 1989).

Information literate teachers have the capability to continuously improve themselves, and to find, locate and utilize the most appropriate teaching instrument for their students by using various teaching approaches and methodologies, new technologies and different sources. Teachers undertake a significant role in encouraging students to have permanent information literacy skills and transferring these skills into other fields. It is necessary to furnish teachers with information literacy skills so that they help their students acquire the skills of information literacy by offering a wider range of opportunities for students (e.g. homework assignments and project topics), accordingly, create a sound learning environment, guide and evaluate students' works from the point of information literacy, cooperate with librarians. Therefore, it is highly important that information literacy skills should be incorporated into teacher candidates' education process during their course of study (Kurbanoglu & Akkoyunlu, 2007, p.4). At this point, there are multiple problems related to curriculum practice. Among them is how teachers —who have the primary responsibility for effective teaching— truly understand, perceive the curriculum, and how their approach to curriculum along with their skills and competences for curriculum practice. To understand and measure more accurately, there is a need to conceptualize these issues for teachers (Akinoglu & Dogan, 2012). Given the fact that teachers use their information literacy skills to effectively implement existing curriculum in the education system and to turn the theory into practice, it can be presumed that their achievement in information literacy will influence their curriculum literacy skills as well.

Bearing in mind that there are plenty of constructivist approach in education, information literacy is considered a part of education process. Since one of the main objectives of information literacy is to raise lifelong learner individuals, the abilities to retrieve, obtain and use the information for problem-solving are among fundamental components of teacher candidates in terms of curriculum practice (Warmkessel & McCade 1997).

The curriculum typically covers and introduces general approach, general objectives, specific objectives (achievements), skill and values associated with specific objectives, instruction model, strategy, methodology and techniques, sense of measurement and assessment as well as the expected role of teacher for a specific course. Those individual teachers who aim to cultivate their students by integrating curriculum objectives into the content should have the understanding of acquisition, content, educational background and assessment elements of the curriculum. In a science course, curriculum is regarded the main syllabus of the course. On the other hand, what is focused in Turkish courses is the curriculum itself. Curriculum highly impacts on courses. For this reason, we could argue that understanding components of curriculum is of high importance in terms of the teaching education.

A study carried out in Turkey has revealed that teacher remain incapable of following legislative amendments and teaching programs related to their area of expertise. The same study also identified that 70 percent of teachers monitors changes in teaching programs by examining school books or guidance books for teachers. It has been seen that only 1 percent of teachers has taken the print version of the revised teaching programs. (TED, 2009, p.16). This

indicates that teachers lead their courses without meticulously analyzing curriculum content. From another point of view, teacher candidates are expected to identify curriculum literacy skills and abilities so that they can use curriculum to develop class activities. Curriculum literacy becomes crucial in terms of training of teacher candidates and improving teacher competencies. In other words, teacher candidates should have the knowledge of curriculum components during their study period, thereby developing literacy of curriculum elements (Bolat, 2017).

Besides facilitating students through various sources of information, teachers are also expected to take on other responsibilities in education such as teaching students to obtain the information and use it for practical application (Rader 1991, p.27). To cultivate teacher candidates' information literacy knowledge and skills through their learning processes, a series of national-level studies should be carried out as well (Breviek, 2000). Bearing in the mind that teaching profession is a lifelong learning experience; teachers are encouraged to continue learning along with pursuing their role of teaching. This becomes practical only when teacher candidates can thoroughly examine the curriculum to be used for retrieving information and information processing. The study of professional competences of teacher made by the Turkish Education Foundation (TED, 2009) results in that teachers lack essential knowledge for analyzing curricula. For this reason, the question we pose here is at which level teacher candidates were equipped with curriculum literacy skills during their study period at Faculty of Education. Basing on the question posed, it is believed that investigation of information literacy and curriculum literacy of teacher candidates may contribute to more clearly understand teacher competencies and thus reshape the curricula of education faculties.

In this respect, the aim of this study was to investigate information literacy and curriculum literacy levels of teacher candidates and to identify the relationship between them through their course of study at Faculty of Education. Therefore, it is attempted to achieve the following subquestions:

1. Do information literacy and curriculum literacy levels of teacher candidates significantly differ according to the variables according to university, department, grade level to the variables identified?
2. What is the level of information literacy of teacher candidates?
3. What is the level of curriculum literacy of teacher candidates?
4. Is there any relationship between information literacy and curriculum literacy of teaching candidates?
5. At which level information literacy levels of teacher candidates predict their curriculum literacy levels?

Methodology

This section provides methodological aspects of the study. In this sense, the research model, the study population and the sample size, the validity and reliability study of data gathering instruments and other tests used for data analysis are presented.

Research Model

The research model was designed as quantative one and general screening model was employed. In this respect, "Relational Screening Model" was utilized. The relational survey models are research models which aim to determine the presence and the level of change variance between two or more variable (Gay, 1987; Gall, J.; Gall, M.D. and Borg, 1999).

Population and Sample

The research population consisted of 3rd and 4th grade students enrolled in the Classroom Education, Preschool Education, Science Education and Social Sciences Education Departments of Pamukkale University and Sinop University in the 2017-2018 academic year. Given the fact that the surveyed teacher candidates were taught curriculum development and practice as "required courses", it is likely to get more accurate answers to the research questions posed in this sense. For this reason, social sciences and science teacher candidates were selected as a subject for the research. Further, as students of the two universities have aforementioned four departments in common, these departments were included to the study.

Table 1. Frequency Distribution of the Sampling Group according to the variables identified

VARIABLE	GROUPS	University		TOTAL
		Pamukkale University	Sinop University	
Department	Classroom Education	156	70	226
	Preschool Education	111	72	183
	Social Sciences Education	113	77	190
	Science Education	158	138	296
Grade Level	3rd Grade	234	180	414
	4th Grade	304	177	481
GRAND TOTAL		538	357	895

In the study, disproportional sampling was administrated to the two universities. This type of sampling is that the researcher chooses a piece of the universe in any way according to the size of the sample. (Arli ve Nazik, 2001, s.75). While the research population for the sampling consists of 3534 people, the sampling number (Balci, 1995, p.111) was found at least 346 people. Yet, the number of the sampling group was increased to reach more reliable results to achieve the goal of the research and accordingly the data was collected from 895 people.

Data Gathering Instruments

In an effort to realize the objective of the research study, two different scales were utilized to identify the levels of information literacy and curriculum literacy of teacher candidates. Initially, "Information Literacy Scale" developed by Adiguzel (2011) was used to determine the levels of information literacy of the teacher candidates.

This scale was developed to assess teacher candidates' approach to gathering and constructing information. Kaiser-Meyer-Olkin (KMO) test was applied to determine the compatibility of the data collected, using the first prototype of the 38 items-scale. Result of the Kaiser-Meyer-Olkin (KMO) value was found as .850. As a result of the factor analysis, 9 dysfunctional items were excluded from the scale and remaining 29 items, whose factor loadings ranged from .460 to 796, were included to the scale. Following the rotation process, four-factors were formed in the scale as follows: "Defining information needs" (8 items), "Access to Information" (11 items), "Use of Information" (5 items) and "Ethical and Legal Settings in Use of Information" (5 items). Cronbach alpha coefficient for the whole scale was found as .928. Explained variance of the scale value was determined as 53.43, whereas eigenvalues, the percent of variance attributable to each factor, was found to be 9.84 for the first factor, 2.34 for the second factor, 1.96 for the third factor, and 1.36 for the fourth factor. Item-total correlation coefficient for the scale ranged from .457 to .735. (Adiguzel, 2011, p.15).

"The Curriculum Literacy Scale" developed by Bolat (2017) was used to determine the levels of the curriculum literacy. The suitability of the data for factor analysis was determined by running the Kaiser-Meyer-Olkin and Bartlett's Test of Sphericity. The results of the Explanatory Factor Analysis (EFA) demonstrated that the scale consisted of two factors, namely, literacy (15 items) and writing (14 items). The overall internal consistency coefficient (Cronbach's Alpha) was determined to be 0.94. As a result of the second implementation of the scale, 215 students participated in the study. Accordingly, confirmatory factor analysis (CFA) was performed to compare the two factor structures and consequently they were verified. Also, two factor structures of the 29 items-scale were verified and reliability and validity of the scale was confirmed (Bolat, 2017, p.121).

Table 2. Reliability Coefficients of the Measurement Scales

Scale	Reliability Coefficient	Item Number
Information Literacy Scale (2011)	.920	29
Curriculum Literacy Scale (2017)	.939	29
Sub-dimensions of Information Literacy Scale		
Defining Information needs	.827	8
Access to Information	.807	11
Use of Information	.740	5
Ethical and Legal Settings in Use of Information	.646	4
Sub-dimensions of Curriculum Literacy Scale		
Reading	.904	15
Writing	.901	14

Much of the literature on reliability is originally based on psychological test, which reliability coefficient of .70 or higher is considered "acceptable" for the reliability of test scores (Tezbasaran, 1996; Buyukozturk, 2006). It is thus concluded that the scale is a reliable instrument and the two scales have higher reliability coefficients. On the other hand, when analyzing reliability coefficients for the subdimensions of the scales, sufficiently reliable coefficients were detected within the sample group.

Data Analysis

In the present study, attempting to identify information and curriculum literacy levels of the teacher candidates, the Kolmogorov-Smirnov test was performed to evaluate the normality of the variables. After evaluating distribution of the variables identified, it was agreed on which parametric or non-parametric test would be applied. Moreover, correlation analysis was conducted to figure out the relationship between the two variables. Multiple regression analysis was administrated to determine predictive power of the information literacy level of teacher candidates on their curriculum literacy level. Lastly, alongside descriptive statistics, arithmetic mean and standard deviation was used to identify teacher candidates' literacy levels in terms of two aspects, namely, information and curriculum.

Findings

In attempt to seek answers to the sub questions posed in the study, a series of analyses conducted and findings of these analyses are presenting in this section.

The Significance Levels of Information Literacy and Curriculum Literacy of Teacher Candidates In Terms of the Variables Identified

The first sub-problem of the study seeks to answer the following question: "Do information literacy and curriculum literacy levels of teacher candidates significantly differ. According to the variables of university, department and grade level? Within this framework, the variables of the present research were tested for normality test to determine the distribution of variables.

Table 3. The Kolmogorov-Smirnov Test Administrated to the Variables Identified

Normality Test			
	Kolmogorov-Smirnov		
	Statistic	Degree of Freedom	Level of Significance
University	.393	895	.000
Department	.208	895	.000
Grade Level	.361	895	.000

The present study investigated whether there were significant differences according to the variables of university, department and grade level. This research was carried out with 3rd and 4th grade teacher candidates receiving education in the Faculty of Education, Preschool Education, Science Education, Social Sciences Education and Classroom Education departments of the two different universities. Kolmogorov-Smirnov (K-S) test is used to determine whether sample data is normally distributed. If the test indicates normality, parametric tests are performed, otherwise non-parametric tests are used. Non-parametric test is used when "p" value is significant at 0.05. If the significance level is $p<0.05$, then parametric test is employed (Can, 2014, p.89). Thus, Kolmogorov-Smirnov test was conducted and the significance level of the test was found .05 according to all variables identified. Then, non-parametric tests were utilized. Firstly, Mann Whitney U test was used to determine if university variable has a significant effect on teacher candidates' information literacy and curriculum literacy levels.

Table 4. The Significance Level of Teacher Candidates' Information and Curriculum Literacy Levels on the"University" Variable

			N	Mean Rank	Sum Total	U	Z	p
INFORMATION LITERACY	Defining Information Needs	Pamukkale University	538	443.42	238561.5	93570.5	-.652	.514
		Sinop University	357	454.90	162398.5			
	Access to Information	Pamukkale University	538	453.61	244043.0	92476.0	-.872	.383
		Sinop University	357	438.26	156022			
	Use of Information	Pamukkale University	538	448.67	241384.5	95672.5	-.096	.924
		Sinop University	357	446.99	159575.5			
	Ethical and Legal Settings in Use of Information	Pamukkale University	538	449.97	242086.0	94971.0	-.281	.777
		Sinop University	357	445.03	158874.0			
	GRAND TOTAL	Pamukkale University	538	450.34	242282.0	94237.0	-.404	.686
		Sinop University	357	443.21	157783.0			
CURRICULUM LITERACY	Reading	Pamukkale University	538	419.27	225569.5	80578.5	-4.088	.000*
		Sinop University	357	491.29	175390.5			
	Writing	Pamukkale University	538	419.00	225421.0	80430.0	-4.063	.000*
		Sinop University	357	490.57	174644.0			
	GRAND TOTAL	Pamukkale University	538	417.80	224777.0	79786.0	-4.230	.000*
		Sinop University	357	492.38	175288.0			

*The significance level is taken as $p<0.05$

Given the results of Mann Whitney U test shown in Table 5, it is seen that the variables identified indicate significant differences. To determine the literacy levels of teacher candidates from two different aspects, the present study investigated whether the university variable showed significant difference in the subdimensions of teacher candidates' information literacy and curriculum literacy levels.

As a result, the findings suggested that, information levels of teacher candidates, in terms of both sub-dimensions and grand total, do not significantly differ according to the university variable. Yet, as regards to the curriculum literacy of teacher candidates, the university variable is significant at the .05 level as shown in Table 4. Broadly speaking, while the mean rank of teacher candidates studying at Pamukkale University was found to be 417.80 (U:79786.0; Z: -4.230), the mean rank of those studying at Sinop University was found to be 492.38 (U:79786.0; Z: -4.230). In light of these findings, we can ascertain that curriculum literacy levels of teacher candidates of Sinop University are higher than those studying at Pamukkale University.

In terms of the subdimensions, significant difference at the level .05 was appeared in the subdimensions of "reading" and "writing". In terms of the subdimension of reading, while mean rank of teacher candidates of Pamukkale University is 419.27 (U:80578.5; Z: -4.088), teacher candidates of Sinop University show a mean rank of 491.29 (U:80578.5; Z: -4.088). According to these results, as given in Table 4, the curriculum literacy level of teacher candidates of Sinop Universiy is higher than those studying at Pamukkale University in terms of the subdimension of reading. Similarly, there is a meaningful difference in the advantage of teacher candidates of Sinop University with respect to the subdimension of curriculum literacy, namely, the subdimension of writing. When analyzing mean ranks according to the subdimension of writing, we see that the mean rank of teacher candidates of Pamukkale University is 419.00 (U:80430.0; Z: -4.063) wheres the mean rank of teacher candidates of Sinop University was found to be 19.00 (U:80430.0; Z: -4.063).

As a result, while there is no meaningful difference in the subdimension of the level of information literacy in terms of the university variable in the study, which primarily aims to analyze information and curriculum literacy of teacher candidates, it is a striking finding that university variable is significant at the level of .05 in terms of both subdimensions and grand total of the curriculum literacy.

Table 5. Significance Level of Teacher Candidates' Information and Curriculum Literacy on the "Grade Level" Variable

			N	Mean Ranks	Sum Total	U	Z	p
INFORMATION LITERACY	Defining Information Needs	3 th Grade	431	445.78	184551.0	98646.0	-.239	.811
		4th Grade	481	449.91	216409.0			
	Access to Information	3 th Grade	431	451.08	186296.0	97848.0	-.385	.700
		4th Grade	481	444.43	213769.0			
	Use of Information	3 th Grade	431	437.35	181063.0	95158.0	-1.153	.249
		4th Grade	481	457.17	219987.0			
	Ethical and Legal Settings in Use of Information	3 th Grade	431	429.63	177867.5	91962.5	-1.995	.046*
		4th Grade	481	463.81	223092.5			
	GRAND TOTAL	3 th Grade	431	443.16	183027.0	97536.0	-.465	.642
		4th Grade	481	451.22	217038.0			
CURRICULUM LUTERACY	Reading	3 th Grade	431	397.46	164550.50	78645.5	-5.435	.000*
		4th Grade	481	491.50	236409.50			
	Writing	3 th Grade	431	427.64	176613.5	91122.5	-2.134	.033*
		4th Grade	481	464.56	223451.5			
	GRAND TOTAL	3 th Grade	431	406.40	167843.5	82352.5	-4.412	.000*
		4th Grade	481	482.79	232221.5			

* The significance level is taken as p<0.05

The result of Mann Whitney U test is presented in Table 5. In this sense, the variables being identified showed meaningful difference levels. The study, aiming at identifying the literacy level of teacher candidates from two different aspects, examined whether the subdimensions of the information literacy and curriculum literacy differ according to the "grade" variable.

Given the results obtained, it is clearly seen that only the variable of "Ethical and legal settings in use of information" is significant in terms of information literacy level. In this sense, the mean rank of the 4th teacher candidates within the sample group is found 463.81 (U:91962.5; U:-1.995), whereas the mean rank of the 3rd grade teacher candidates is calculated as 429.63 (U:91962.5; U:-1.995). We thus suggest that 4th grade teacher candidates have higher mean rank in terms of their level of information literacy regarding the variable of ethical and legal settings in use of information

Regarding the curriculum literacy of teacher candidates, there is a significant difference in terms of both subdimensions and grand total, as previously found in the “university" variable. As the data obtained illustrates, there is a significant difference regarding the subdimension of “reading” in favor of 4th grade students compared to the 3th grade students. According the data in Table 5, the mean rank of the 4th grade teacher candidates is 491.50 (U:78645.5; Z:-5.435), while mean rank of 3rd grade teacher candidates is 397.46 (U:78645.5; Z:-5.435)

Similarly, with respect to the second subdimension, the variable of “writing”, the result is in favor of the 4th grade teacher candidates. As to the rank mean, the mean rank of the 4th grade teacher candidates is 464.56 (U:91122.5; Z:-2.134) while the mean rank of 3th grade teacher candidates is 427.64 (U:91122.5; Z:-2.134). On the other hand, in terms of grand mean rank, 4th grade teacher candidates 482.79 (U:82352.5; Z:-4.412), have higher mean rank compared to the 3th grade teacher candidates 406.40 (U:82352.5; Z:-4.412).

Table 6. The Significance Level of Teacher Candidates' Information and Curriculum Literacy Levels on the “Department” Variable

	Subdimension	Departments	N	Mean Ranks	χ^2	df	p
INFORMATION LITERACY	Defining Information Needs	Preschool Education	226	472.93	6.244	3	.100
		Science Education	183	411.49			
		Social Sciences Education	190	459.73			
		Classroom Education	296	444.01			
	Access to Information	Preschool Education	226	459.49	4.717	3	.194
		Science Education	183	429.48			
		Social Sciences Education	190	475.40			
		Classroom Education	296	431.67			
	Use of Information	Preschool Education	226	449.78	3.954	3	.266
		Science Education	183	427.23			
		Social Sciences Education	190	477.39			
		Classroom Education	296	440.62			
	Ethical and Legal Settings in Use of Information	Preschool Education	226	455.23	7.292	3	.063
		Science Education	183	429.74			
		Social Sciences Education	190	487.20			
		Classroom Education	296	428.60			
	GRAND TOTAL	Preschool Education	226	463.41	6.412	3	.093
		Science Education	183	421.84			
		Social Sciences Education	190	478.01			
		Classroom Education	296	431.74			
CURRICULUM LITERACT	Reading	Preschool Education	226	458.92	2.060	3	.560
		Science Education	183	424.31			
		Social Sciences Education	190	450.74			
		Classroom Education	296	452.55			
	Writing	Preschool Education	226	448.03	7.514	3	.050*
		Science Education	183	405.54			
		Social Sciences Education	190	449.21			
		Classroom Education	296	471.94			
	GRAND TOTAL	Preschool Education	226	454.02	4.429	3	.219
		Science Education	183	413.23			
		Social Sciences Education	190	448.78			
		Classroom Education	296	462.89			

* The significance level is taken as p<0.05

The study investigated whether the last variable, "departments" in which teacher candidates study, differ significantly according to the levels of information and curriculum literacy and the data obtained were specified in Table 6. Accordingly, only the subdimension of "writing" of curriculum literacy level of teacher candidates showed significant differentiation (χ^2 =7.514; df:3; p=.050) according to department variable, which is detected at least between two groups and at the .05 level. Therefore, Dunnett-C analysis was performed to see which variable groups significantly differ with each other and multiple comparisons were run. Dunnett-C multiple comparison test, which can be used for non-parametric variables or when the variances are not equal, is based on average mean rank and q –distribution. (Gunlu, 2016).

Table 7. "Dunnett-C Test Administered to the"Trainings Taken" Variable

	Preschool Education	Science Education	Social Sciences Education	Classroom Education
Preschool Education			*	
Science Education				
Social Sciences Education	*			
Classroom Education				

In line with the results of Dunnett- C analysis performed, we see a meaningful significance between social science education and preschool teaching education. Accordingly, the mean ranks of the groups that are significantly different from each other are given in Table 8.

Table 8. The results of Mann Whitney U Test Administrated to the Variable of "Department"

Departments	N	Mean Rank	Sum Total	U	Z	p
Social Sciences Education	190	488.05	4899.5	605.500	-1.568	.037*
Preschool Education	226	431.56	1266.5			

* The significance level is taken as p<0.05

The results obtained from the data indicates that the mean rank of the teacher candidates studying in the Department of Social Studies Education (488.05 (U:605.500; Z:-1.568) is higher than those studying in the Department of Preschool Education. (431.56 (U:605.500; Z:-1.568). The significant difference found in favor of social sciences teachers is also observed in between the mean ranks of the two groups.

Information Literacy Level of Teacher Candidates

The second sub- problem of the study seeks to answer the following question: 'What is the level of information literacy of teacher candidates?' using the research scale for measuring the information literacy level of teacher candidates. In this respect, arithmetic mean and standard deviation values were tabulated in Table 9.

Table 9. Information Literacy Level of the Sample Group

No	N	□	Ss	Frequency Level	No	N	□	Ss	Frequency Level
I25	895	4.25	.796	Always	I13	895	3.93	.700	Usually
I26	895	4.17	.866	Usually	I17	895	3.92	.790	Usually
I1	895	4.16	.755	Usually	I6	895	3.92	.767	Usually
I20	895	4.06	.772	Usually	I23	895	3.91	.841	Usually
I2	895	4.03	.756	Usually	I9	895	3.86	.868	Usually
I21	895	4.02	.833	Usually	I27	895	3.86	.893	Usually
I12	895	4.00	.893	Usually	I19	895	3.85	.832	Usually
I15	895	4.00	.837	Usually	I8	895	3.84	.890	Usually
I11	895	3.99	.709	Usually	I29	895	3.81	.889	Usually
I10	895	3.98	.867	Usually	I16	895	3.78	.837	Usually
I4	895	3.97	.704	Usually	I14	895	3.78	.907	Usually
I22	895	3.97	.825	Usually	I24	895	3.78	.804	Usually
I3	895	3.95	.713	Usually	I28	895	3.72	.881	Usually
I7	895	3.94	.812	Usually	I5	895	3.68	.902	Usually
I18	895	3.94	.901	Usually					

According to data obtained from the sample group shown in Table 9, merely 25th item out of the total 29 item-scale indicates frequency at the level of "Always", while all other items had the average scores at the level of "Usually". Given the highest mean rank with regard to the likert-scale can be at the level of 5.00, the highest mean were found to be 4.25

Basing on the results given in Table 9 indicating that the mean rank of the items is distributed between 3.68 and 4.25 which represents a narrow range, we could imply that frequency level of information literacy level of teacher candidates are close to each other. To understand it more clearly, the graphic is illustrated in Figure 1.

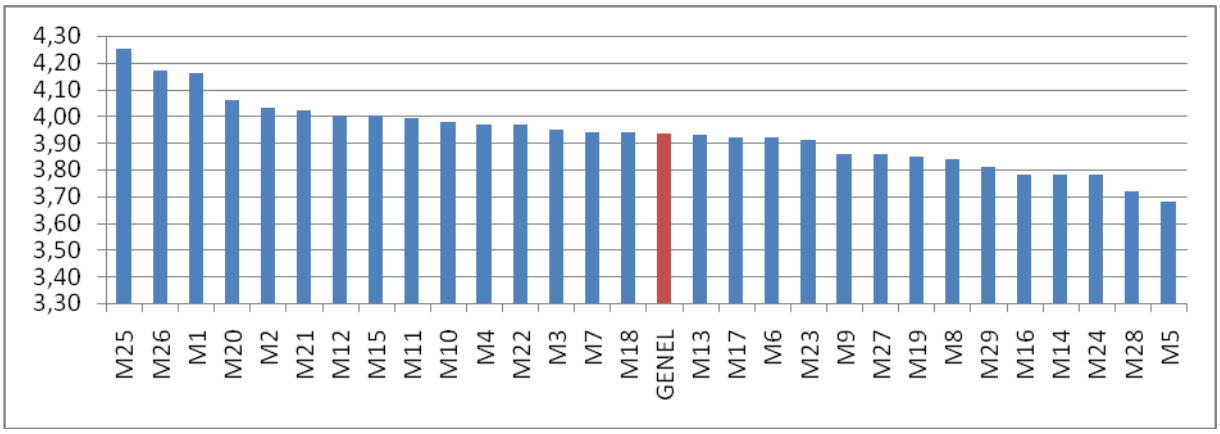

Figure 1. Information Literacy Levels

From Figure 1 we can see that the mean ranks of items are almost equal each other as mentioned above and the mean of approximately 14 items ranked lower than the grand mean rank (= 3,93) . Considering negatively skewed distribution of teacher candidates' information literacy levels, we can infer that teacher candidates in the sample group have higher academic achievement scores.

The Curriculum Literacy Level of Teacher Candidates

The third sub- problem of the study seeks to answer the following question:" What is the level of curriculum literacy of teacher candidates?" using the research scale for measuring the curriculum literacy level of teacher candidates. In this respect, arithmetic mean and standard deviation values were shown in Table 10.

Table 10. Curriculum Literacy Level of the Sample Group

Item No	N		Ss	Level of Agree	Item No	N		Ss	Level of Agree
I13	895	4,23	.803	Strongly Agree	I26	895	4,00	.720	Agree
I3	895	4,21	.671	Strongly Agree	I27	895	3,99	.837	Agree
I29	895	4,16	.674	Agree	I11	895	3,98	.705	Agree
I25	895	4,12	.725	Agree	I5	895	3,98	.741	Agree
I20	895	4,11	.749	Agree	I10	895	3,97	.776	Agree
I12	895	4,11	.679	Agree	I14	895	3,94	.734	Agree
I21	895	4,10	.711	Agree	I1	895	3,90	.663	Agree
I4	895	4,09	.647	Agree	I24	895	3,90	.775	Agree
I2	895	4,08	.732	Agree	I17	895	3,88	.767	Agree
I23	895	4,07	.776	Agree	I22	895	3,83	.778	Agree
I18	895	4,07	.731	Agree	I28	895	3,82	.836	Agree
I8	895	4,07	.749	Agree	I7	895	3,78	.794	Agree
I15	895	4,03	.764	Agree	I19	895	3,77	.767	Agree
I16	895	4,02	.781	Agree	I6	895	3,71	.889	Agree
I9	895	4,01	.746	Agree					

Basing on the data shown in Table 10, we found out that only 13th and 3rd items out of the total 29 item-scale demonstrates frequency at the level of " Strongly Agree" , while other items had the average scores at the level of " Agree". Given the highest mean rank with regard to the likert-scale can be at the level of 5.00, the highest mean were found to be 4.23.

According to the findings in Table 10, scale items range between 3.71 and 4.23, as previously observed in information literacy levels, the agree level of teacher candidates are almost equal each other. To see it more clearly, the graphic in Figure 2 were presented.

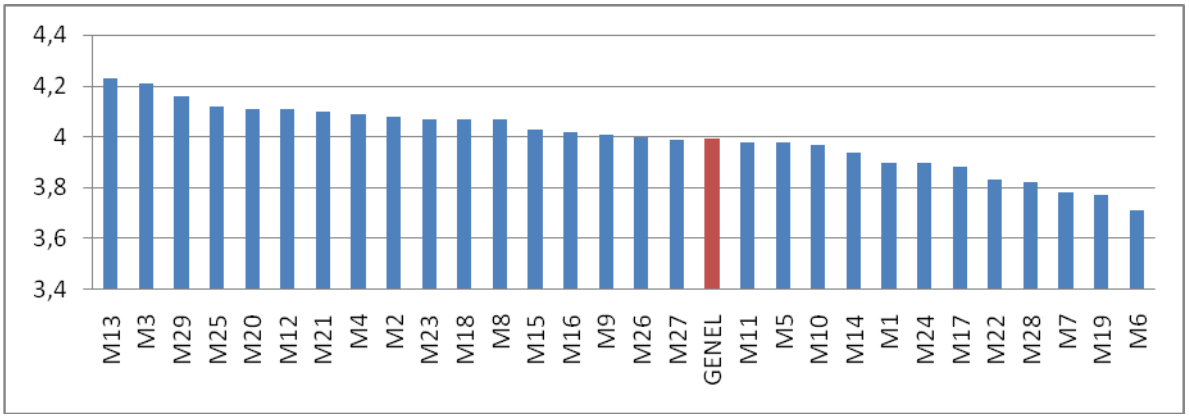

Figure 2. Curriculum Literacy Levels

As seen in Figure 2, the mean ranks of items are almost equal each other as expressed above. On the other hand, the mean of approximately 12 items ranked lower than the grand mean ranks (= 3,99). Considering negatively skewed distribution of teacher candidates' curriculum literacy levels, we can infer that teacher candidates in the sample group achive higher academic achievement scores in terms of the curriculum literacy.

The Relationship between Information Literacy and Curriculum Literacy of Teacher Candidates

The fourth subproblem of the study discusses the relationship between two dependent variables, namely, information literacy level and curriculum literacy level. According to K-S (Kolmogorov-Smirnov) test administrated to subdimensions of two variables, p values are found higher than .05 and normal distribution is observed. This means that Pearson correlation between variables can be performed in terms of correlation (Can, 2014).

Table 11. The Correlation between Information Literacy Levels and Curriculum Literacy Levels

Scales	1	2	3	4	5	6	7	8
1. Information Literacy	-							
2. Defining Information Needs	,87**	-						
3. Access to Information	,91**	,73**	-					
4. Use of Information	,83**	,63**	,67**	-				
5. Ethical and Legal Settings in Use of Information	,71**	,48**	,52**	,63**	-			
6. Curriculum Literacy	,57**	,52**	,52**	,44**	,43**	-		
7. Reading	,58**	,55**	,53**	,44**	,40**	,92**	-	
8.Writing	,48**	,41**	,43**	,38**	,39**	,70**	,92**	-

N=895, ** p<0.01

The correlation coefficient of +1.00 indicates a perfect positive correlation and coefficient of -1.00 indicates a perfect negative. A correlation of .00 indicates that there is no relationship between the two variables. In term of interpreting the size of correlation coefficient, we do not see common ranges, yet, it should be considered that following ranges can be often used to interpret the correlation. If correlation coefficient as absolute value is between 0.70-1.00, it means high; if it is between 0.70- 0.30, it means medium; if it is between 0.30-0.00, it means low level relation (Buyukozturk, 2006).

As a result of the correlation analysis conducted, the relationship level between information literacy and curriculum literacy levels of teacher candidates are investigated one by one in terms of the subdimensions and the findings are shown in Table11. According to the findings obtained a correlation value above the value of .700 meaning high level positive relationship was observed both in information literacy and curriculum literacy. From another perspective, there were no high level of relationship between information literacy and curriculum literacy levels of teacher candidates. Broadly speaking, low and medium level positive correlation values were identified.

While the highest positive correlation relationship was observed between the total scores of the variable of curriculum literacy and the subdimension of "reading" with the value of .926, all correlation coefficients indicate meaningful difference at the level of .001, which proves the relationships identified.

The Predictive Power of Information Literacy Levels of Teacher Candidates on Curriculum Literacy Levels

Considering high correlations of 0.80-0.90 among predictor (independent) variables should not be found, we can imply basing on the data in Table 11 that it is appropriate to apply multiple regression test.

Table 12. Skewness and Kurtosis Coefficients of Subdimensions of Information Literacy Level

		Defining Information Needs	Access to Information	Use of Information	Ethical and Legal Settings in Use of Information
N	Valid	895	895	895	895
	Missing	0	0	0	0
Mean		31.24	43.18	19.61	16.05
Median		31.00	43.00	20.00	16.00
Mode		27	45	21	16
Skewness		-.250	-.445	-.679	-.675
Std. Error of Skewness		.082	.082	.082	.082
Kurtosis		.175	.488	1.569	.481
Std. Error of Kurtosis		.163	.163	.163	.163

Analysis of the data in table 11 shows that there is a positive relationship between information literacy and curriculum literacy of teacher candidates. In the meanwhile, skeweness and kurtosis values of subdimensions of information literacy level— the independent variable used in subproblem —range between -1,96 and +1,96 as seen in Table 12. Can (2014, p.85) expresses that as widely accepted norm, if you divide the each values of skeweness and kurtosis by their standard errors and the results is between -1.96 and +1.96, it means your data set is normally distributed.

Table 13. The Impact of Information Literacy Levels of Teacher Candidates on Their Curriculum Literacy Levels (Multiple Regression Analysis)

Independent Variable	B	Standard Error	ß	t	p	Pairwise r	Partial r
Defining Information Needs	0.792	0.122	0.271	6.469	.000	0.527	0.212
Access to Information	0.549	0.108	0.223	5.092	.000	0.523	0.168
Use of Information	0.070	0.205	0.014	0.340	.734	0.448	0.011
Ethical and Legal Settings in Use of Information	1.013	0.206	0.175	4.190	.000	0.431	0.163
Fixed	49.864	3.186	-	15.650	.000	-	-
R= .584	R^2=.341						
$F_{(4 - 888)}$=114.930	P=0,000						

According to multiple linear regression analysis performed to determine at which level following subdimensions of information literacy (independent variables) —assumed to have a direct effect on curriculum literacy of teacher candidates—, "Defining information needs", "Access to Information", "Use of Information", "Ethical and Legal Settings in Use of Information" predict curriculum literacy levels of teacher candidates , it is found that there is a significant relationship (R=0.584, R^2=0.341) between subdimensions of information literacy and curriculum literacy levels ($F_{(4-888)}$ =114.93, p<0.05). Aforesaid these four variables together explain 34% of the change in curriculum literacy levels.

According to standardized regression coefficients, predictor variables' importance order is relatively defining information needs (ß= 0.271), access to information (ß=0.223), ethical and legal settings in use of information (ß=0.175) and use of information (ß=0.014). Regarding significance tests' regression coefficients, it is seen that the predictive variables at a level of p<0.05, except than that use of information, are significant predictors on curriculum literacy.

Considering the relationship between predictive variables and curriculum literacy, we see the following correlations: defining information needs (r=0.527) [after controlling the effects of other predictive variables (r=0.212)] , access to information (r=0.523) [after controlling the effects of other predictive variables (r=0.168)] ,use of information (r=0.448) [after controlling the effects of other predictive variables (r=0.011)] and ethical and legal settings in use of information (r=0.431) [after controlling the effects of other predictive variables (r=0.163)].

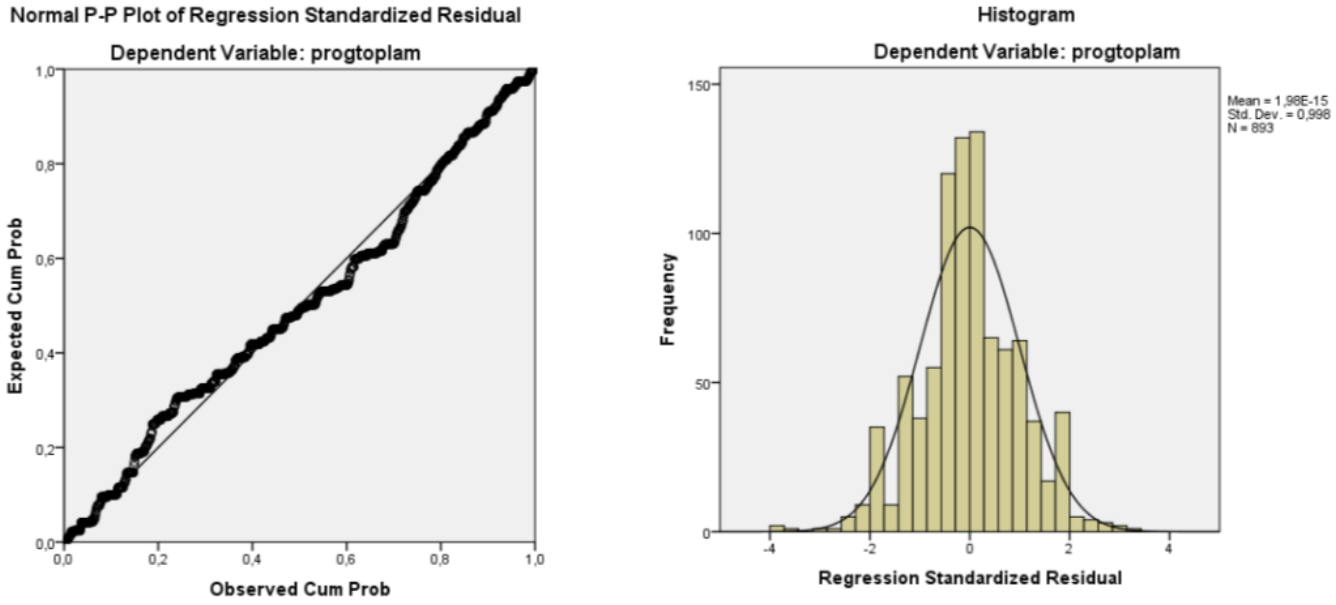

Figure 3. The Graph of the Multiple Regression Analysis

Discussion and Recommendation

As regards the analysis whether information literacy and curriculum literacy levels of teacher candidates significantly differ according to the some variables, the results reveal that the university variable has no significant effect on subdimensions and grand total of information literacy levels. Yet, it is a quite striking finding that the university variable demonstrates .05 significance level in terms of subdimensions and grand total of curriculum literacy levels. On these grounds, we can contend that curriculum literacy level of teacher candidates studying at Sinop University is higher than those of Pamukkale University.

Information literacy is considered fundamental skill for individuals of all ages in the 21st century, which lifelong learning is a necessity, and this paved the way for the design of learning environments toward information literacy skills at various levels. Information literacy programs are particularly prevalent in secondary education. As highlighted by Polat and Odabasi (2008), universities have now understood the need to cultivate information literacy skills which are very crucial for all disciplines and studies. The reason there is no significant difference in information literacy of teacher candidates in terms of the variable of university is because two universities share common courses and contents in their undergraduate teacher education programs and there is a lack of educational programs for information literacy. A study made by Unal and Er (2015) using different sample is also consistent with the present study. Further, in terms of the university variable, teacher candidates' curriculum literacy level in both reading and writing subdimensions demonstrates significant difference in favor of Sinop University. When viewing the courses and contents in the teacher education program of the two faculties surveyed, it is seen that there are some courses that may positively affect curriculum literacy. Preschool education department of Sinop University involves such elective courses as " Curriculum in Preschool Education" and science teaching department of the same university offers an elective course, namely, "Curriculum and Planning in Science Teaching", thereby explaining the reason of significant difference found in favor of curriculum literacy of Sinop University. Significant difference found are probably due to, unlike other universities, teacher candidates studying at Sinop University take elective courses such as "Curriculum in Preschool Education" and "Curriculum and Planning in Science Teaching".

In terms of the grade level variable, the information literacy level of teacher candidates merely differ significantly in the subdimension of "Ethical and Legal Settings in Use of Information" in favor of 4th grade. Education faculties in Turkey have serious drawbacks on information literacy curriculum. In this context, we could argue that there is no significant difference in the subdimensions of information literacy level of teacher candidates according to the grade level variable. However, even a slight difference observed in the subdimension of ethical and legal settings in use of information at the level of 4th grade could be resulted from "Education Ethics and Professional Ethic" courses taught in the final terms of the preschool and social sciences departments. With the wider significance of information literacy in higher education, the number of information literacy training courses has been increased to raise more qualified teachers equipped with 21st century skills. Given the analysis of curriculum literacy level of teacher candidates in terms of the grade variable, there is a significant difference in favor of 4th grade teacher candidates with respect to curriculum literacy level alongside reading and writing subdimensions. This may result from "Curriculum Development in Education, Curriculum and Planning in Science Education and Preschool Prep and Curriculum in Primary Education" courses taught in seventh and following terms of teacher candidates.

It is seen that the variable of department, the last variable related to the first sub-goal of the research, do not have a significant effect on information literacy of teacher candidates. In the same vein, a study by Onal and Cetin (2014) suggests that there is no meaningful difference between information literacy and the departments of teacher candidates. Thus, the outcomes of the two researches are consistent with each other. Additionally, it is revealed that there is a meaningful difference in favor of social science department compared to preschool education in terms of the subdimension of writing of the curriculum literacy. Regarding the low level of difference in curriculum literacy, we could argue that it is particularly because of previous educational background of social sciences students before attending higher education, their interest areas, personal works and the effects of departments' hidden curricula.

In addition to efforts being made to come up with information age in the 21st century, the concept of information literacy is becoming increasingly important so as to carry out information literacy and instruction processes more effectively. As the present study shows, the mean of teacher candidates' information literacy levels is quite high. In particular, there is a narrow range of mean scores with respect to both literacy levels. This may be because teacher candidates in the sample group share common peculiarities in terms of both information literacy and curriculum literacy.

Information Literacy Competency Standards for Higher Education was published by Association of College and Research Libraries (ACRL, 2016). These standards and resources are evaluated based on the information need and contexts within which information is used. Information literacy involves seeking, gathering, evaluating and communicating information. In this respect, creative thoughts, intellectual ownership, copyrights, fair use, open access, ethic and related topics should be taken into consideration. The nature of researches is repeatable and accommodates questioning process, resulting in more complex researches, new questions and new research fields. Researchers suggest new views and thoughts in line with different opinions and ideas. Information seeking is permanent and should be repetitive actions.

"The Information Literacy Scale" used in the study were developed in compliance with the Standards of Association of College and Research Libraries. The result that teacher candidates' level of information literacy is higher evidently indicates that teacher candidates considerably meet these standards.

The present study also demonstrates that the mean rank of curriculum literacy of the teacher candidates within the sample group is high. The means of training teachers, teaching achievements, content-teaching management and educational material, should be chosen and organized in line with aspects of students. It is of vital importance that functional teaching programs should be implemented, teaching activities, and the student' interest and ability and academic performance should be evaluated; student deficiencies should be eliminated, successful students should be motivated in terms of effective teaching process (Demirel, 2005). In this context, the result that the curriculum level of the teacher candidates is considerably high clearly demonstrates that future teachers have the competence to use their educational curriculum more effectively.

The data obtained from teacher candidates provides strong evidence that the information literacy and curriculum literacy have higher relationship among themselves. However, no high level of relationship is found between information literacy levels and curriculum literacy levels of teacher candidates. On the whole, positive correlation values at low and medium levels were determined. Therefore, it is apparent that the more information literacy level of teacher candidates increases, the more their curriculum literacy level increases or vice versa.

According to multiple linear regression analysis performed to determine at which level following subdimensions of information literacy (independent variables) —assumed to have a direct effect on curriculum literacy of teacher candidates—, "Defining information needs", "Access to Information", "Use of Information", "Ethical and Legal Settings in Use of Information" predict curriculum literacy levels of teacher candidates, it is found that there is a significant relationship between subdimensions of information literacy and curriculum literacy levels. High predictive power is one of the important criteria for measurement results. (Tasdemir, 2014). This study highlights that information literacy scores of teacher candidates explain 34% of the curriculum literacy of the teacher candidates.

Universities act as an engine of growth in terms of the development of information literacy and curriculum literacy skills, defined as 21st century skills all over the world. Teacher candidates , in particular, must develop their lifelong learning skills to be successful in their education and professional lives. Teachers are required to know how to access and interpret the information, to understand the curriculum, and to gain practical skills. With this goal in mind, new projects can be developed to help the teacher candidates use the faculty libraries more effectively. New courses can be integrated into education faculties' curricula to allow teacher candidates develop their information and curriculum literacy skills.

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